late friend. It is of course impossible to supply the place of the naturalist whose collections I shall do the best to describe, for with him has perished much knowledge of the habits and distribution of the animals, and although this want can be partially atoned for by the copious notes he has left behind, much unfortunately can never be replaced. . . . There is always more difficulty in procuring specimens of Mammalia than in collecting terrestrial animals belonging to most of the other classes of vertebrata and invertebrata, and this is especially the case with the larger forms. It is consequently not to be expected that the species represented will be more than a portion of those inhabiting the country. Still the collection is rich in some respects, and especially in kinds of rodents, and it adds largely to our knowledge of the fauna of Western Tibet and Eastern Turkistan. *The larger mammals, indeed, were originally better represented, but after Dr. Stoliczka's death many specimens appear to have been removed from the collection.* Such at least was the case with the ruminants. In a private letter which Dr. Stoliczka wrote to me, he told me he had sent twenty-two skins of wild sheep from Kashgar. Of these only eleven—seven males and four females—are now forthcoming, and not one of these has fine horns. There is not a single specimen of *Ovis poli* from the Pamir, the original locality, although I have reason to believe that Dr. Stoliczka brought away one head at least. Lastly, there are *skeletons* of wild sheep and ibex in the collection *of which the heads have disappeared.* It is highly probable that other specimens besides those of *Ovis poli* have been similarly made over to private individuals. The value of the collection has been seriously diminished by its being broken up, and the finest specimens distributed, before it had been examined," &c.

(True extract.) H. H. GODWIN-AUSTEN,
Superintendent Topographical Survey of India

Glands of the Cherry Laurel

IN NATURE (vol. viii., p. 245) Mr. Thiselton Dyer, in answer to a correspondent, says that he knows of no explanation of the purpose or origin of the nectariferous glands on the back of the leaf of the cherry laurel. Mr. Darwin ("Origin of Species," sixth edition, p. 73) says: "Certain plants excrete sweet juice, apparently for the sake of eliminating something injurious from the sap; this is effected, for instance, by glands at the base of the stipules in some Leguminosæ, and at the backs of the leaves of the common laurel. This juice, though small in quantity, is greedily sought by insects; but their visits do not in any way benefit the plant." Glands cannot be considered very complex modifications of cellular tissue. They exist on all parts of plants, and contain a great variety of secretions. Mr. Darwin and others have shown that they perform the varied functions of secreting nectar to attract insects to flowers, of secreting odorous matter for the same purpose, of absorbing ammonia from rain-water and the products of decomposed or digested animal or vegetable matter, and of secreting acids capable of digesting solids. The existence of free acids in the plant would be injurious to it, so that their excretion would be beneficial to it apart from any digestive function which they may in some cases perform. The glands of the laurel are so far unspecialised that they are by no means constant in number or size. As their attracting insects is of no service to the plant, the nectar must be said to be excreted; but, being what Sachs has termed (p. 629) a "secondary product of metastasis," it should be looked upon rather as a physiologically accidental excretion than as positively injurious, as a substance which, having ceased to take part in the processes of growth, has not acquired an indirect function as has the nectar of flowers. To account for the position of the glands it may be suggested that, as in other evergreens, the leaves of the laurel are "reservoirs of reserve material" in which metastasis, including the separation of the "formative materials" from the "secondary products," mainly takes place (Sachs, p. 627).

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Saw-fish inhabiting Fresh Water

I AM not aware if a curious fact connected with the lake near Manila has been noticed by any traveller.

The Laguna de Baij is a large sheet of water some ninety miles in circumference, divided by an island and two peninsulas, from which it is often spoken of as the "lakes." This lagoon receives the waters of the small rivers of the provinces of the Laguna and Morong, and its only outlet is the river Pasig, which flows into the bay between the military city and suburbs of Manila. The volume of water discharged by the Pasig is augmented by that of another river which joins the main stream some eight or nine miles from Manila, and during gales in the S. W. monsoon, which prevent the free egress of the water, the Pasig overflows and covers the flat land round Manila.

The water of the lake is quite fresh, and after settling, perfectly potable. At certain times the waters of the lake of Baij possess an urticating property which makes bathing very disagreeable from the irritation they produce. The natives (who account for everything in some way or other) attribute this to the Pistia, a plant which is so abundant as to fill up small bays and form floating islands of considerable size. Great quantities of this plant are carried down the river into the bay, and are seen sometimes a long way out at sea, killed and yellow from the effect of the salt water. Sections of the leaves are beautiful microscopic objects. The lake is separated from the Bay of Manila by a few miles of very flat land, and there can be little doubt that before this barrier was thrown up it formed part of, or at least communicated with, the bay. One proof that the waters were once salt is the existence of a bank of fossil oysters at the point of Julu-julu, some twenty miles from the outlet by the river. When this barrier was raised the waters of the lake became gradually fresh from the influx of those of a number of small rivers which drain the surrounding provinces, the only outlet for which (as before mentioned) is the river Pasig.

The peculiarity to which I have alluded is the existence of a species of small shark and numbers of Saw-fish (*Pristis*) in the perfectly fresh water of the lake. They are seldom or never met with in the river, but there is a fishery in the lagoon in which numbers of the latter are taken. The flesh is eaten, the livers give a good deal of oil, and the snouts of the larger specimens make very formidable weapons, which the natives use and which are at times sent down to Manila as curiosities. These saw-fish, now living in perfectly fresh water, have no doubt become gradually accustomed to the change, as has been the case with the marine species of Crustacea discovered by Prof. Lóven in the fresh water lakes of Sweden.*

I am unable to describe the sharks, which I think from the account given me are a small species of dog-fish, quite harmless. Very different, however, are a larger kind inhabiting the brackish water of the lake of Bombon, in which is situated the active volcano of Taal (south-east of the great lake, about twenty or twenty-five miles distant by road). This kind of shark is feared by the natives, who avoid bathing at points which they frequent.

Manila W. W. WOOD

Observations on Fish

IN May last the writer dug a tank within the premises at Garden Reach. About the end of July it was stocked with young fish of several kinds, among others a species of carp, called by the natives "Katlah," which abounds in the turbid waters of the Hooghly, within the range of the tides. The fry varied from half an inch to an inch in length, some even smaller. The "Kutlah" does not breed in fresh water, but attains an extraordinary size in a wonderfully short time in ponds. So very rapid has been the increase of the fish in question, that the fact seems worthy of chronicle in the pages of NATURE. On Sept. 22, the tank was swept with nets to catch one or two fish of the pike species that had been introduced accidentally with the others, and attained a size that rendered them dangerous to the fry of other kinds. In the net several dozens of the "carp" referred to were taken; one of the largest weighed 14 oz, and measured 11 inches from the end of the upper lip to the tip of the tail, 1¾ inches thick behind the shoulder, and 3½ inches in breadth; the others were only one or two ounces lighter.

The tank (pond) in which these fish throve so marvellously is only 65 feet long by 58 feet broad, and 13 feet deep. The natives, many of whom live within the compound, wash their rice and other food in the water, preparatory to cooking, furnishing the fish with a large amount of food. As the writer saw the tank dug and the fish put in, there cannot be a doubt about their increase in the short space of three months from small fry barely an inch long, to fair-sized fish 11 to 14 oz. in weight, measuring from 10 to 11 inches. ROBERT U. S. MITCHELL

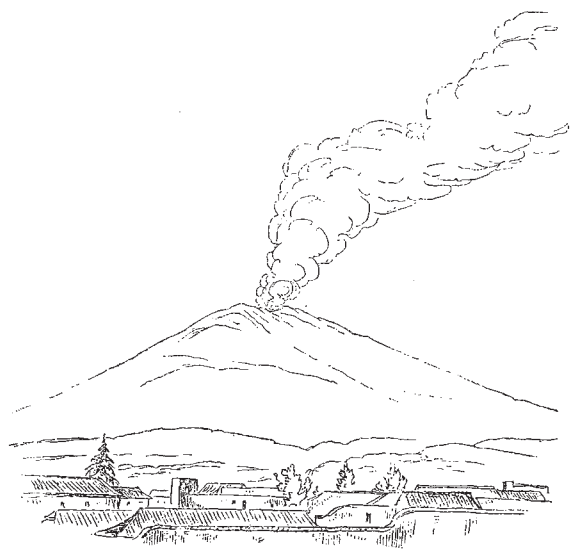
Misti and its Cloud

IN NATURE, vol. xii. p. 487, Mr. Stevenson gives an interesting example of the genesis of clouds, due to hills of about

* See NATURE, vol. i. p. 454.

900 feet high. Something similar is well known to the inhabitants of Arequipa, Peru. The city is built at the base of the extinct volcano "Misti," which rises above the plaza of Arequipa to a height of about 12,500 feet; Arequipa itself being over 7,000 feet above the level of the sea. It is not an uncommon occurrence (during the fall of the year, February and March) in the morning, from sunrise till about ten o'clock, to see a succession of clouds rolling along the summit from N.E. to S.W., much as if huge masses of white smoke were issuing from the extinct crater. These clouds are either suddenly shot upward by meeting the current from the S.W. and lost at a distance of from 30,000 to 40,000 feet to the eastward from the summit, or else, rolling over the summit, they are carried by the easterly breezes till they become absorbed by the dryer and warmer air of the region to the southward of Misti.

It must be remembered that between Arequipa and the sea, at a distance of not more than thirty miles, extends the great sandy desert of Islay, having an average breadth of about twenty-five miles, and before the days of the railroad the great terror of all travellers from the sea-coast to the interior. Of course the winds blowing across this desert (a part of the great rainless belt



of Peru) are greatly heated at all seasons of the year. The eastern slope of Misti, on the contrary, forms the edge of the elevated plateau extending for more than 150 miles to the eastern slope of the Andes, having an altitude of from 10,000 to 14,000 feet, and the amount of rain falling in this district is very great.

The formation of the cloud, seen from Arequipa on the summit only of Misti, is plainly seen from the railroad leading to Puno, which, after leaving Arequipa, makes a gigantic sweep northward round the Chacharni Mountains, and winds its way eastward behind Misti at a height of about 12,500 feet above the level of the sea. There I have several times seen masses of vapour, condensed into huge white clouds rolling along the slopes of Misti, travel up with great rapidity towards the summit, and either follow its crest as described above, or become at once reabsorbed on reaching the top. This shows plainly that the clouds seen from Arequipa are not due to volcanic action; the Indians also all agree in stating that there is no tradition among them of Misti having been active. I enclose a sketch of Misti and its cloud from a photograph obtained during my visit to Peru.

ALEXANDER AGASSIZ

Cambridge, Mass., Nov. 6

The Effect of Waves

IT is generally believed that at a moderate depth the influence of heavy waves ceases, and that during a hurricane all is quiet a few fathoms beneath the surface. If this be correct, why should a swell show such a marked increase in height when it rolls over the edge of soundings?

On the parallel of Cape Clear, in longitude 15° W., seamen are familiar with this phenomenon, although the depth is nearly five hundred fathoms; at times it is so marked that the dead reckoning may be checked by carefully noting the increase in the depth of the hollow of the waves. Shortly after the edge of soundings is passed the sea becomes more regular, and consequently less dangerous to deeply laden vessels.

Anyone who has watched during a moderate breeze the commotion of the water close to a quay wall can form a good idea of the ocean when it receives its first check against the Irish Plateau; the great waves twist around each other, run up and down in heaps, and then fall suddenly as if bereft, in a great measure, of their forward motion.

Again, it is a well-known fact that during a "norther" in the Gulf of Mexico the frailest vessels weather out the storm if they can cross the edge of the Campeachy Banks; a striking proof that at a depth of over fifty fathoms there is sufficient abrasion to destroy the force of the heaviest wave in a very effectual style. On one occasion the writer witnessed this remarkable fact by running from a turbulent sea into comparative smooth water in this locality.

On George's Shoals, off Nantucket, during a heavy gale, the New York pilots and masters of coasting vessels assert that sand is frequently left on deck after a sea has broken on board, although the depth of water may be twelve or fourteen fathoms. It must require an enormous amount of ebullition at the bottom to raise such dense matter to the surface through such a distance; for a cubic foot of ordinary sea-sand weighs about 100 pounds.

In this wild spot the tide, which frequently runs with a velocity of three miles per hour, would assist the lifting power of the wave if running counter to it. During a winter gale, when the strong springs are thus running, the confusion of the sea is indescribable, although the depth may be thirty fathoms. The shortness of the sea (*i.e.* the distance between the crests of the waves) on the banks of Newfoundland, where the soundings are from thirty to fifty fathoms, is noticed by all the navigators of the Western Atlantic, as it reduces the speed of an ocean steamer more than the heavier waves of deeper water with a similar force of wind will do. It is evident that this can only arise from the friction of the bottom, as the waves increase in height when deeper water is reached a short distance to the eastward.

In the Gulf Stream north of the Straits of Bemine, after a "norther" has blown a few hours, the surface of the sea is covered with lanes of weed, although only a few patches might have been seen before the commencement of the gale. As these lanes are often at a considerable distance from shoal water, which lies at right angles to the direction of the current and wind, it is evident they must have grown near the spot where they float, and been torn from their moorings by the mechanical force of the waves.

W. W. KIDDLE

OUR ASTRONOMICAL COLUMN

THE TOTAL SOLAR ECLIPSE OF 1605, Oct. 12.—Clavius, observing the solar eclipse of April 9, 1567, at its maximum, remarked "a narrow ring of light round the moon which he supposed to be the margin of the solar disc." Kepler, however, maintained that this could not be in reality a portion of the sun, because the moon's apparent diameter at the time must have been greater than that of the sun, and he concluded, as Prof. Grant relates in his "History of Physical Astronomy," that the sun must have been totally covered by the moon while the narrow ring of light was visible, a phenomenon again exhibited in the total eclipse of Oct. 12, 1605, which was observed at Naples. Of this eclipse Kepler says (De Stella Nova in pede Serpentarii)—"Accuratè rectum fuisse totum Solem, quod quidem non diu duraverit; in medio, ubi Luna, fuisse speciem quasi nigræ nubis; circumcirca rubentem et flammeum splendorem, æqualis undique latitudinis, qui bonam cœli partem occupaverit: E regioni Solis, versus Septentrionem, cœlum obscurum planè, et cum profunda nox est; stellas tamen non visas."

Adopting the same system of elements of the lunar motions, employed in previous calculations of past eclipses, the results of which have appeared in this column, we have the following elements of the eclipse to which Kepler refers:—